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CHAPTER THREE:

OVERHEAD SIGN STRUCTURES

Overhead sign structures (Figure 3-1) support signs over the traveled roadway. The work involves furnishing and erecting of overhead sign structures, walkways, and sign lighting according to the Specifications and the contract plans. In this chapter the installation of overhead sign structures includes the pre-construction, construction inspection, and measurement and payment duties. The following sources are required to be reviewed:

- 1) Sections **702, 803, 909.01, and 909.02.**
- 2) Standard Sheets **802-SNOH-01** thru **802-SNOH-16** and **802-SNWW-01** thru **802-SNWW-11.**

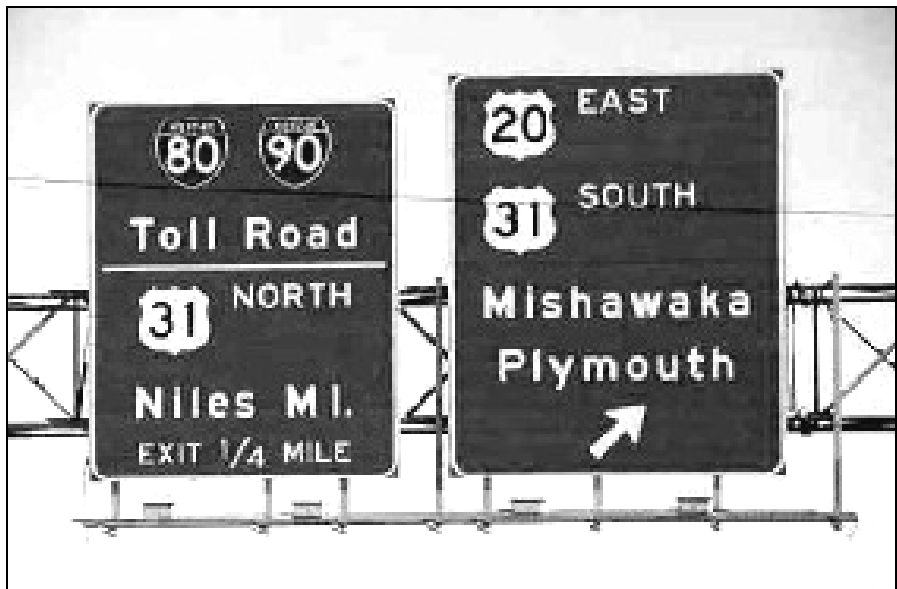


Figure 3-1. Overhead Sign Structure

PRE-CONSTRUCTION DUTIES

Overhead sign structures involve much tighter horizontal and vertical tolerances than ground mounted signs. The technician is required to become familiar with both the plan and quantity sheets before any work is started on the contract and preferably before the pre-construction conference. The following items are required to be considered:

- 1) Prior to the fabrication of an overhead sign structure, shop drawings are submitted by the Contractor's supplier to the INDOT Division of Design.
- 2) The Contractor has the responsibility of checking the roadway cross sections and structure dimensions prior to the preparation of the shop drawings. If any discrepancies are found, the INDOT Division of Design is required to be notified prior to the preparation of the shop drawings.
- 3) Overhead sign structures are staked by the Construction Engineering Sub-Contractor. The overhead sign structure is required to comply with the following requirements:
 - a. The sign structure is required to be perpendicular to the pavement. A transit is used to set the alignment stakes.
 - b. The outline of the foundation of the sign structure is staked as shown on the plan.
 - c. All utility clearances requirements are required to be observed. Since there is little or no tolerance in the location of an overhead sign structure, utility relocation may be necessary.
 - d. Any possible drainage structure and highway lighting circuit conflicts are required to be checked. A change order may be required if unplanned relocation of a drainage structure or lighting circuitry is required.
 - e. Final guard rail clearances are required to be calculated for compliance with the guard rail policy in Section 24 of the General Instructions To Field Employees.
- 4) The length of the upright(s) is determined. The calculations for truss, monotube, and cantilever sign structures are all different, but the following criteria is the same for all:
 - a. The difference in elevation between the edge of pavement and the top of the concrete foundation is determined by projection of the required slope(s) using the details for Shoulder or Median Guard Rail Installation as shown on Standard Sheet **802-SNGP-01**.

- b) The vertical clearance as shown on the plan detail sheets is used. (17 ft minimum and 18 ft maximum)

CONSTRUCTION FOUNDATION INSPECTION DUTIES

The Contractor may not begin any work on the sign structure foundation until:

- 1) Approved sign structure shop drawings are received by the PE/PS.
- 2) Approved panel and sheet sign shop drawings are received by the PE/PS.
- 3) All relocation work has been complete.

CONCRETE FOUNDATIONS

When inspecting the installation of the foundation(s) for an overhead structure, the following items are required to be considered:

- 1) The Basis For Approval for the overhead sign structure and anchor bolts is a Type C Certification. The Basis For Approval for reinforcing steel is the approved J number for the manufacturer. The Basis For Approval for concrete is the sequence number reported on the IT 652.
- 2) The foundation excavation is completed to the levels and dimensions as shown on the plans.
- 3) If bed rock or boulders are encountered during excavation, they are removed to the depth as shown on the plans.
- 4) Excavated material not used in the backfill is removed within 24 h.
- 5) Concrete classes A, B, or C may be used in the foundations.
- 6) Reinforcing steel is placed as set out in the plans and standard sheets. The proper sizing of bars, correct numbers and spacing of bars, and proper bar cover are checked.
- 7) For cantilever sign structure foundations, a tremie is used until the concrete is within 5 ft of the top of the foundation.

- 8) The concrete is consolidated using a vibrator adequate for the size of the pour.
- 9) Foundations incorporated into sections of concrete barrier wall receive a Class 2 rubbed finish.
- 10) All other areas of exposed foundation concrete receive a Class 1 rubbed finish.

STRUCTURE ERECTION

The Contractor is responsible for handling the overhead sign structure carefully during loading, shipment, unloading, and erection to avoid damage to any member of the structure. The technician is required to consider the following items:

- 1) The Basis For Approval for overhead sign structures and the signs is a Type C Certification.
- 2) The structure is inspected before unloading, during all operations, and until the structure erection is complete. Any damage detected shall be repaired before final acceptance.
- 3) Any field welding is done in accordance with Section **803** for aluminum, or Section **711.32** for steel. Before any field welding is performed, contact the PE/PS or Area Engineer.
- 4) For sign trusses or monotubes, the required camber is built onto the structure on the ground using wooden blocks.
- 5) Gaps in the flange connections not exceeding 1/8 in. are shimmed before tightening the flange bolts.
- 6) Sign, walkway, handrail, and lighting support brackets are generally installed on the ground in accordance with the approved sign structure shop drawings before the structure is lifted in place.

SIGN INSTALLATION

When inspecting the installation of sign, walkway, handrail, and lighting support brackets the technician is required to consider the following items:

- 1) The same support bracket may support the sign, the walkway, the handrail, and the lighting assembly.
- 2) For sign widths greater than 30 in., a minimum of two sign supports is required.
- 3) For sign heights of 7 ft or less, the maximum sign support spacing is 7 ft, and the maximum sign overhang beyond the sign support is 3.5 ft.
- 4) For sign heights greater than 7 ft, the maximum sign supports spacing is 5 ft, and the maximum sign overhang beyond the sign support will be 2.5 ft.
- 5) The maximum spacing of walkway support brackets is 7 ft, and the maximum walkway overhang beyond the walkway support brackets is 1 ft.
- 6) If all of the above conditions are not met, additional supports are added.
- 7) Panel sign clips are attached to each sign support required to support the panel sign. The top and bottom of the panel sign is clipped to both sides of the sign support bracket. The intermediate clips at 1 ft spacing is staggered on either side of the sign support bracket.

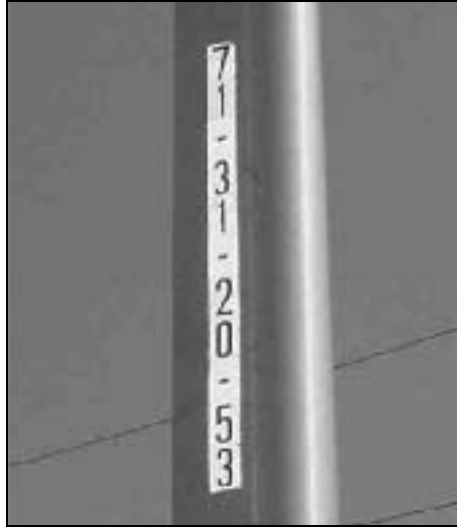


Figure 3-2. Overhead Sign Structure Identification Numbers

During the erection of the overhead sign structure, traffic is required to be safely controlled in accordance with Section **801**. Three working days prior to commencing work that requires the stoppage of traffic, written notice is required to be given to the District Director and the Indiana State Police. The notice gives the specific location, time, and date of the work.

TRAFFIC CONTROL (Section 801.03)

The following requirements are necessary for proper traffic control:

- 1) Advance warning signs are required to be located according to the Indiana Manual On Uniform Traffic Control Devices.
- 2) On multi-lane divided highways, a minimum of four flagmen are required to control traffic. Eight flagmen are required for road closure in both directions.
- 3) On non-divided highways, a minimum of four flagmen are required to control traffic.
- 4) Traffic stoppage may not exceed 20 minutes at one time. There shall be enough time between consecutive stoppages to allow traffic flow to return to normal.
- 5) No traffic is allowed to pass directly beneath any personnel working on an overhead structure.
- 6) Nylon straps or other approved methods are required to be used in lifting the structure so as not to damage the structure.

- 7) When structure erection is started, the work is required to be completed the same day to prevent damage caused by wind vibration of the upright.

MEASUREMENT AND PAYMENT

Items used in the installation of overhead sign structures are measured and paid for as follows:

- 1) Concrete dimensions are measured along neat lines and paid for by the cubic yard.
- 2) Reinforcing steel is measured by the length and paid for in pounds after conversion according to Section **703.07**.
- 3) Each type of overhead sign structure is paid for as Each.
- 4) Sheet signs attached to panel signs are measured by the square foot as determined by the maximum length and width of the sheet metal required to produce the sheet sign.
- 5) Panel signs, including legend and/or copy, are measured and paid for by the square foot.
- 6) Sign support brackets, sign hardware, excavation, backfill, or other incidentals needed to complete are not paid for directly, but the cost is included in the cost of the pay items.